DOCUMENT RESUME

ED 104 449 JC 750 200

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TITLE Cognitive Style: A Science to Influence the Policy of Individualizing Instruction.
PUB DATE Jan 74
NOTE 37p.; Practicum presented to Nova University in partial fulfillment of the requirements for the Doctor of Education degree. For related documents see JC 750 199 and 202

EDRS PRICE MF-$0.76 HC-$1.95 PLUS POSTAGE
DESCRIPTORS *Cognitive Processes; Communication Problems; Developmental Programs; Individual Characteristics; *Individualized Instruction; Junior Colleges; *Junior College Students; Learning Characteristics; *Learning Modalities; *Learning Processes; Remedial Instruction; Symbolic Learning
IDENTIFIERS Cognitive Style; *Educational Sciences; Hill (Joseph)

ABSTRACT

If a community college is truly committed to the ideal of individualized learning, it must make a concerted effort to discern the learning style preferences of each student. This document demonstrates that the conceptual framework for such discernment exists in the theory of Educational Sciences, created by Dr. Joseph E. Hill of Oakland Community College in Michigan. The seven Educational Sciences provide a common structure for the applied field of knowledge called input education. All seven fields are discussed and the system of discovering a student's learning style is reviewed. Thirty-three freshman developmental students at Central Piedmont Community College (North Carolina) were given an interest inventory to discover their preferred learning styles relative to three of the Educational Sciences: symbolic orientation (to various theoretical and qualitative symbols), cultural determinants (individual, family, and/or associate), and modalities of inference (magnitude, difference, relationship, appraisal, deductive reasoning, or a combination of these). These 33 students evidenced 12 theoretical symbolic orientation groupings, 33 qualitative symbolic orientation groupings, eight different patterns of cultural determinants, and 14 different modality of inference patterns. On the basis of these findings, recommendations for the provision of varied kinds of learning experiences are made. (DC)

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ED104449

COGNITIVE STYLE: A SCIENCE TO INFLUENCE THE POLICY OF INDIVIDUALIZING INSTRUCTION

by

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Central Piedmont Community College

JC 750 200

A PRACTICUM PRESENTED TO NOVA UNIVERSITY
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE
DEGREE OF DOCTOR OF EDUCATION

NOVA UNIVERSITY

January 8, 1974

Table of Contents

	Page
List of Tables	ii
Introduction	1
Background and Significance	1
Procedures	8
Results	10
Recommendations	30
Bibliography	33

List of Tables

Table		Page
1.	Twelve Different Theoretical Symbolic Orientation Patterns ----------	25
2.	Thirty-three Different Qualitative Symbolic Orientation Patterns --------	26
3.	Eight Different Patterns of Cultural Determinants ----------	27
4.	Fourteen Modality of Inference Patterns ----------	28
5.	Sample of Inventory Items ----------	29

INTRODUCTION

Individualized learning has received much attention at the community college level during the past five years. And many significant contributions to the process have resulted. However, most of the efforts to individualize instruction have come mainly from an "instructional" point of view; and have resulted in many programmed texts, packages, modules, self-paced concepts, etc. Not much attention has been given to the idea that an individual may possess a learning style all his own that may not fit into a package.

It is the purpose of this practicum to study the results and effects of testing a group of CPCC students for their preferred learning styles within the concept of Educational Sciences as proposed by Dr. Joseph E. Hill of Oakland Community College in Michigan. It is hoped that the effects will influence the process of individualizing learning in the Advancement Studies Program of Central Piedmont Community College and ultimately in the whole college.

BACKGROUND AND SIGNIFICANCE

Central Piedmont Community College's philosophy commits itself to the concept of individualizing instruction. Many departments of the College have successfully developed forms of learning to allow the learner to move through a series of steps or lessons to the mastery

of an objective at his own pace. More specifically under this same philosophy the department of Advancement Studies (a developmental studies program) commits itself to accept each individual as he is and help him then to reach whatever goals he sets for himself. One of the problems with this philosophy, the self-pacing that exists and the committment to the individual is that no attempts are made to ascertain what that individual student is like. Normally when a student registers for a course, he must follow the routine or plan of that course whether or not his style is similar to the format of the course. Seldom are enough options open to the student to allow him to choose the manner in which he would like to learn.

In the Advancement Studies Program which offers new learning opportunities to an average of 1600 students per quarter, there is an increasing need to have a system for learning an individual student's preferred learning style. And once the preferred style is known, that style should influence the design of instruction for that student.

It is the intent of this study to demonstrate that the conceptual framework for such a system exists in the form of Educational Sciences.

Dr. Joseph E. Hill of Oakland Community College in Michigan created the Educational Sciences as a common structure for the applied field of knowledge called input education. Presently there are seven educational sciences: (1) symbols and their meanings, (2) cultural determinants, (3) modalities of inference, (4) memory - concern,

(5) cognitive style, (6) teaching, administrative and counseling styles, and (7) systemic analysis decision-making.[1]

The first science, symbols and their meanings, assumes that man uses two kinds of symbols: theoretical and qualitative. A theoretical symbol is that symbol which presents to the awareness of the individual something different from that which the symbol itself is.[2] Hence there are four theoretical symbols: theoretical auditory linguistic, theoretical visual linguistic, theoretical visual quantitative, and theoretical auditory quantitative. The qualitative symbol is that symbol which presents and then represents to the awareness of the individual that which the symbol itself is to that individual.

The second science, cultural determinants, has to do with the cultural effect on the meaning of the symbol. These cultural effects are described in terms of individual associate and family influences.

The third science has to do with the individual's modality of inference, that is, the form of inference he tends to use.

The fourth science, memory concern, is not used in this report.

The fifth science, cognitive style or preferred learning style, is the combined relationship of symbols and their meanings, cultural

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[1] J. J. Berry and T. J. Sutton, "The Educational Sciences, A Bibliography with Commentary," 1973, p.4.

[2] Ibid.

determinants, and modalities of inference for an individual.[3] The sixth and seventh sciences are not used in this study.

For further interpretation of the process of testing for an individual's preferred learning style, there are four theoretical symbols:[4]

T(VL) Theoretical Visual Linguistic is the ability to find meaning from words one sees.

T(AL) Theoretical Auditory Linguistic is the ability to acquire meaning through hearing spoken words.

T(VQ) Theoretical Visual Quantitative is the ability to acquire by seeing numerical symbols and relationships.

T(AQ) Theoretical Auditory Quantitative is the ability to acquire meaning by hearing numerical symbols and relationships.

There are five qualitative symbols associated with sensory stimuli:[5]

Q(A) Qualitative Auditory is the ability to perceive meaning through the sense of hearing.

Q(O) Qualitative Olfactory is the ability to perceive meaning through the sense of smell.

Q(S) Qualitative Savory is the ability to perceive meaning by the sense of taste.

Q(V) Qualitative Visual is the ability to perceive meaning through sight.

Q(T) Qualitative Tactile is the ability to perceive meaning through touch.

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[3] J. E. Hill, "Cognitive Style as an Educational Science" (Bloomfield Hills, Michigan: Oakland Community College Press, 1970), pp. 3 - 6.

[4] J. E. Hill, "Symbols and Their Meanings" (Bloomfield Hills, Michigan: Oakland Community College Press, 1970), p. 5.

[5] Ibid.

There are five qualitative symbols that are programmatic in nature:[6]

Q(P) Qualitative Proprioceptive is the ability to synthesize a number of symbolic mediations into a single performance.

Q(PD) Qualitative Proprioceptive Dextral is a predominance of right-eyed, right-handed and right-footed tendencies (a typically right-handed person) while synthesizing a number of symbolic mediations into a complex task.

Q(PK) Qualitative Proprioceptive Kinematics is the ability to synthesize a number of symbolic mediations into a single complex task involving motion.

Q(PS) Qualitative Proprioceptive Sinistral is the predominance of left-eyed, left-handed and left-footed tendencies while synthesizing a number of symbolic mediations into a single performance.

Q(PTM) Qualitative Proprioceptive Temporal is the ability to synthesize a number of symbolic mediations into a single performance involving timing.

There are ten qualitative symbols associated with cultural codes:[7]

Q(CEM) Qualitative Code Empathetic is sensitivity to the feelings of others.

Q(CES) Qualitative Code Esthetic is ability to enjoy the beauty of an object or an idea.

Q(CET) Qualitative Code Ethic is committment to a set of values, a group of principles.

Q(CH) Qualitative Code Histrionic is the ability to exhibit a deliberate behavior or to play a role.

Q(CK) Qualitative Code Kinesics is the ability to understand, and to communicate by non-linguistic functions - such as facial expressions and motions of the body.

Q(CKH) Qualitative Code Kinesthetic is the ability to perform motor skills, or effect muscular coordination.

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[6] Ibid.

[7] Ibid.

Q(CP) Qualitative Code Proxemics is the ability to judge the physical and social distance that the other person would permit.

Q(CS) Qualitative Code Synnoetics is personal knowledge of oneself.

Q(CT) Qualitative Code Transactional is the ability to maintain a positive communicative interaction to influence the goals of the persons involved.

Q(CTM) Qualitative Code Temporal is the ability to respond or behave according to time expectations. (See appendix, page 34 for actual use of these symbols.)

In the second set there are three cultural determinants of the meaning of symbols.[8]

I. Individuality is reflected by the person's need to quote definitions or explain in his own words.

A Associates influence may be observed in a person who explains or discusses matters mainly in the words of his associates.

F Family influences may be observed in the person who frequently uses examples of parents, children, wife, husband, etc. to explain or define.

(See appendix for actual use of these symbols.)

In the third set, modalities of inference, a person's inference pattern may be:[9]

M Magnitude is a form of reasoning that uses norms or classes and requires definition.

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[8] J. E. Hill, "The Institute for Educational Sciences" (Bloomfield Hills, Michigan: Oakland Community College Press) p. 2.

[9] Ibid, p. 3.

D Difference is a pattern of reasoning that looks at contrasts or comparisons.

R Relationship is a pattern of reasoning that synthesizes a number dimension into unified meaning or analysis to discover component parts.

L Appraisal is a pattern of reasoning that is employed by an individual who uses all of the three modalities, M,D, and R, giving equal weight to each in his reasoning process.

K Deductive is a pattern of reasoning that uses logical proof to make an inference.

(See appendix for actual use of these symbols.)

An individual's modality of inference may be any one of the above or any combination.

An acutal map indicating a person's preferred learning style will show all majors in all set by printing the symbol for that quality in capital letters (TVL) and all minors with a prime notation (T'AL). (See appendix.) To be ranked a major, an individual must score within the 50th - 99th percentile range, and to be ranked a "minor," one must score within the 29th - 49th percentile. Negligibles or scores below these do not print.

It is believed that each individual will react somewhat differently to any given set of stimuli. That is, he will have his own set of major and minor symbolic orientations, his own cultural determinants and his own modality of inference. This combined reaction to symbols and their meanings, to cultural determinants, and to modalities of inference make up an individual's preferred learning style.

PROCEDURES

Thirty-three Central Piedmont Community College freshmen were given an interest inventory designed by Joseph E. Hill of Oakland Community College in Michigan. The students in this group were all from English 9310, an Advancement Studies developmental writing course. They were from sections seven and eight. They ranged in age from 18-46. There were 17 females and 16 males in the group. Participation in the experiment was voluntary.

Oakland Community College agreed to process the data and mail the resulting maps back to CPCC at a cost of $1.00 per person. The Vice President of Learning Resources at CPCC, Mr. Worth Campbell, agreed that the school would support the study financially.

This inventory is designed to discover each student's preferred learning style relative to three of the Educational Sciences: symbolic orientation, cultural determinants and modalities of inference.[10]

In any student's search for meaning, he first receives information through both theoretical and qualitative symbols. In this inventory the statements are designed to test the students' major symbolic orientation both to theoretical and to qualitative symbols. (See table 5 for samples of the statements.)

In addition to symbols and their meanings, the inventory seeks to determine the major and minor cultural determinants: individual, family, associate.

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[10] Virginia Svagr, "The Educational Sciences." Oakland Community College, 1973. (mimeographed.)

Also the inventory is designed to seek the individual's preferred modality of inference: does he infer from magnitude, difference, relationship, apprasial, or deductive reasoning or a combination of these?

A combined relationship of the individual's symbolic orientation, his cultural determinants, and his modality of inference, then is that individual's preferred learning style. (In the complete concept of educational sciences, there is a fourth part of an individual's style, memory concern. At this time the memory set is not sufficiently developed and is not used in this study.)

In the process each student responds to a series of statements: usually, sometimes, never. He marks his responses on IBM data cards. In this inventory there were six tests for a total of 216 responses.

Although there is no time limit, the total inventory takes approximately one hour. The student is advised to react quickly to the statements and not to puzzle over them.

Data cards for each student with his name, sex and social security number were collected and mailed to Oakland Community College for analysis. The analysis for each student is printed in the form of a "map" showing the major and minor symbolic orientation, the major and minor cultural determinants, and the major and minor modalities of inference. (See appendix for each student's map.)

Upon receipt from OCC, the maps then were analyzed for their similarities and differences.

RESULTS

People differ greatly in their preferred learning styles. Thirty-three CPCC students who were tested for preferred learning styles demonstrated wide ranges between their learning styles. Following is a brief verbal summary of each student's demonstrated style resulting from his responses to a series of six tests designed to discover his preference of style. (See appendix for each student's actual map.)

1. Student Almond is an eighteen year old male college transfer student with major theoretical symbolic orientation to visual linguistic, visual quantitative and auditory linguistic. He shows major orientation to fourteen of the qualitative symbols with the first of the order being proxemics, synnoetics, empathetic, transactional and kinesics.
   His cultural determinants are associate and individual with minor family.
   Almond's modality of inference pattern is relationship and difference with minor magnitude. He would tend to appraise that under consideration before making an inference.

2. Student Alexander is a nineteen year old male physical therapy student with a major theoretical symbolic orientation to visual linguistic. He shows major responses to six qualitative symbols: proxemics, kinesics, histrionic, tactile, savory and auditory.
   His cultural determinants are individual and family with minor associate influence.

Alexander's modality of inference pattern is relationship with minor difference.

3. Student Birkett is a nineteen year old male business administration student with major theoretical symbolic orientation to visual quantitative, visual linguistic and auditory quantitative.
   His major qualitative symbols are esthetic, kinesthetic, empathetic, tactile, savory and auditory.
   His cultural determinants are individual and family with minor associate influence.
   Birkett's modality of inference pattern is relationship and difference with minor magnitude. He, therefore, would tend to appraise things under consideration before making an inference.

4. Student Bowden is an eighteen year old female human services student with a major theoretical symbolic orientation to visual linguistic and auditory linguistic. She demonstrates a major orientation to 14 qualitative symbols with the first of the order being synnoetics, transactional, esthetics, empathetic and proxemics.
   Her cultural determinants are family and individual with minor associate influence.
   Bowden's modality of inference is magnitude and difference with minor relationship influence. Thus, she would tend to be an appraiser before making an inference.

5. Student Caldwell is a nineteen year old male college transfer student with a major theoretical symbolic orientation to visual linguistic. He demonstrates a major orientation to five

qualitative symbols: proxemics, synnoetics, visual, tactile, and savory.

Caldwell's cultural determinants are individual with minor associate and family influence.

His modality of inference is realtionship, magnitude with minor difference. He would, therefore, tend to be an appraiser in making inferences.

6. Student Canipe is an eighteen year old female dental hygiene student with a major theoretical symbolic orientation to visual linguistic and visual quantitative. She demonstrates a major orientation to eleven qualitative symbols with the first of the order being kinesics, esthetic, empathetic, ethical and proxemics.

   Her cultural determinants are associate with minor individual and family influence.

   Canipe's modality of inference pattern is relationship and magnitude with minor difference. She would tend to be an appraiser before making an inference.

7. Student Carriker is an eighteen year old college transfer student with a major theoretical symbolic orientation to auditory linguistic. He demonstrates a major orientation to eleven of the qualitative symbols with the first of the order being proxemics, synnoetics, kinesthetics, esthetics, and ethical.

   His cultural determinants are individual with minor family and associate influence.

Carriker's modality of inference is magnitude with deductive reasoning and minor difference and relationship influences.

8. Student Craven is an eighteen year old female physical therapy student with a major theoretical symbolic orientation to visual quantitative. She demonstrates a major orientation to the qualitative symbols of family.
   Her cultural determinants are major associate with minor individual and family influence.
   Craven's modality of inference is relationship and magnitude with minor difference. She would tend to make inferences from appraisal.

9. Student Elam is a nineteen year old male college transfer student with a major theoretical symbolic orientation to visual linguistic. He shows a major orientation to fifteen of the qualitative symbols with the top of the order being synnoetics, empathy, esthetic, transactional and proxemics.
   His cultural determinants are individual and associate with minor family influence.
   Elam's modality of inference is realtionship with minor difference and magnitude. Thus, he would tend to be an appraiser in making inferences.

10. Student Englebert is an eighteen year old female college transfer student with a major theoretical symbolic orientation to visual linguistic. She shows a major orientation to the qualitative symbols of esthetic, proxemics, kinesics, empathetic, tactile

and savory.

Her cultural determinants are individual with minor associate and family influence.

Englebert's modality of inference is relationship with minor difference and magnitude. She would tend to be an appraiser in making inferences.

11. Student Fletcher is an eighteen year old female nursing student with major theoretical symbolic orientation to visual quantitative, visual linguistic, and auditory linguistic. She shows a major orientation to twelve of the qualitative symbols with the first of the order being empathetic, proxemics, histrionic, esthetic and synnoetics.

Her cultural determinants are family and individual with minor associate.

Fletcher's modality of inference is relationship with minor magnitude and difference. Thus she would tend to be an appraiser in making inferences.

12. Student Gardner is a twenty year old male data processing student with a major theoretical symbolic orientation to visual linguistic. He shows a major orientation to the qualitative symbols of esthetics, proxemics, kinesthetic, ethics, visual tactile, savory and auditory.

His cultural determinants are individual with minor family and associate influence.

Gardner's modality of inference is appraisal.

13. Student Gorry is a twenty-two year old male, college transfer student with no major theoretical symbolic orientation. He shows major orientation to eleven of the qualitative symbols with the first of the order being synnoetics, empathetic, kinesthetic, esthetic and proxemics.
His cultural determinants are individual with minor associate and family influence.
Gorry's modality of inference is relationship and difference with minor magnitude.

14. Student Griffith is a forty-three year old female college transfer student with major theoretical symbolic orientations to auditory linguistic, and visual quantitative. She shows major orientation to eleven of the qualitative symbols with the first of the order being kinesics, ethical, proxemics, empathetic, and esthetic.
Her cultural determinants are family with minor individual and associate influence.
Griffith's modality of inference is relationship and magnitude with minor difference. Thus, she would tend to be an appraiser in making inferences.

15. Student Harwell is an eighteen year old male electronics student with no major theoretical symbolic orientation. He shows a major orientation to twelve of the qualitative symbols with the first of the order being synnoetics, transactional, ethical and proxemics.

His cultural determinants are associate with minor individual and family influence.

Harwell's modality of inference is difference and magnitude with minor relationship and also with deductive reasoning. Thus he would tend to make inferences from appraisal and deduction.

16. Student Hooper is an eighteen year old male college transfer student with a major theoretical symbolic orientation to visual linguistic. He shows a major orientation to eleven of the qualitative symbols with the first of the order being proxemics, synnoetics, empathetic, transactional and kinesthetic. Her cultural determinants are associate and individual with minor family influence.

Hooper's modality of inference is magnitude and difference with minor relationship. He shows deductive reasoning capabilities. Thus this student would tend to appraise and then deduct to infer.

17. Student Jefferies is an eighteen year old female nursing student with a major theoretical symbolic orientation to visual linguistic. She shows a major orientation to ten of the qualitative symbols with the first of the order being empathetic, proxemics, esthetics, kinesthetic, and kinesics.

Her cultural determinants are family and individual with minor associate.

Jefferies modality of inference is relationship and difference with minor magnitude. She thus would tend to be an appraiser in making inferences.

18. Student Ledford is a twenty-two year old male college transfer student with major theoretical symbolic orientation to all four: auditory linguistic, visual inguistic, visual quantitative, and auditory quantitative. He shows a major orientation to nine of the qualitative symbols with the first of the order being esthetics, synnoetics, proxemics, empathetic, and kinesthetic.
His cultural determinants are individual with minor family and associate influence.
Ledford's modality of inference is relationship and difference with a minor magnitude. He would tend to be an appraiser in making inferences.

19. Student McCauley is an eighteen year old female dental hygiene student with major theoretical symbolic orientation to auditory linguistic, visual linguistic, and visual quantitative. She shows a major orientation to eleven of the qualitative symbols with the first of the order being proxemics, kinesthetic, esthetic, empathetic, and kinesics.
Her cultural determinants are family with minor individual and associate influence.
McCauley's modality of inference is relationship with minor magnitude and difference. Thus, she would tend to be an appraiser in making inferences.

20. Student McDow is an eighteen year old male auto body student with major theoretical symbolic orientation to all four: visual

quantitative, auditory quantitative, auditory linguistic and visual linguistic. He shows a major orientation to eleven qualitative symbols with the first of the order being empathetic, histrionic, kinesics, transactional and synnoetics.

His cultural determinants are family and associate with minor individual influence.

McDow's modality of inference is relationship and difference with minor magnitude. He also shows deductive reasoning ability. Thus he would tend to appraise and deduct to make an inference.

21. Student McGill is a twenty-five year old male accounting student with a major theoretical symbolic orientation to visual quantitative, visual linguistic, and auditory quantitative. He shows major orientation to ten qualitative symbols with the first of the order being transactional, synnoetics, kinesthetic, histrionic and empathetic.

His cultural determinants are family with minor individual and associate influence.

McGill's modality of inference is relationship, difference with minor magnitude. He also shows deductive reasoning ability. Thus, he would tend to be an appraiser using deduction to make an inference.

22. Student Mayfield is an eighteen year old female data processing student with major theoretical symbolic orientation to visual linguistic and visual quantitative. She shows a major orientation to seven of the qualitative symbols with the first of the order being proxemics, esthetics, kinesthetics, synnoetics and transactional.

Her cultural determinants are individual and family with minor associate influence.

Mayfield's modality of inference is magnitude with minor difference and relationship. She would tend to be an appraiser for making inferences.

23. Student Monroe is an eighteen year old female college transfer student with major theoretical symbolic orientation to visual quantitative. She shows a major orientation to seven of the qualitative symbols with the first of the order being proxemics, empathetic, kinesthetic, visual and tactile.

Her cultural determinants are family with minor associate and individual influence.

Monroe's modality of inference is appraisal.

24. Student Moore is an eighteen year old female nursing student with a major theoretical symbolic orientation to visual linguistic. She shows a major orientation to the qualitative symbols of esthetics, kinesthetic, synnoetics, proxemics, kinesics and empathetic.

Her cultural determinants are individual and family with minor associate influence.

Moore's modality of inference is magnitude with minor relationship and difference. Thus she would tend to be an appraiser in making inferences.

25. Student Peralta is a nineteen year old male college transfer student with no major theoretical orientation. He shows major orientation to ten of the qualitative symbols with the first

of the order being empathetic, synnoetics, esthetics, kinesics and ethical.

His cultural determinants are individual with minor family.

Peralta's modality of inference is appraisal.

26. Student Perry is a twenty-eight year old male nursing student with a major theoretical symbolic orientation to auditory-qualitative. He shows a major orientation to 15 of the qualitative symbols with the first of the order being transactional, kinesthetics, esthetics, empathetic and ethical.

His cultural determinants are associate and individual with minor family influence.

Perry's modality of inference is relationship and difference with minor magnitude. He also shows deductive reasoning capabilities. This student would appraise and then deduct for making an inference.

27. Student Rose is a twenty year old female human services student with a major theoretical orientation to visual linguistic. She shows a major orientation to fourteen of the qualitative symbols with the first of the order being kinesics, esthetics, transactional, synnoetics, and proxemics.

Her cultural determinants are family and individual with minor associate.

Rose's modality of inference is appraisal.

28. Student Rowland is an eighteen year old female special category student with a major theoretical symbolic orientation to visual lingusitic. She shows a major orientation to ten qualitative symbols with the first of the order being synnoetics, proxemics, esthetics, kinesthetics and kinesics.

Her cultural determinants are individual and associate with minor family influence.

Rowland's modality of inference is difference, magnitude, with minor relationship. She also demonstrates deductive reasoning capabilities. Thus, she is an appraiser who deducts to make an inference.

29. Student Stegall is an eighteen year old female college transfer student with a major theoretical symbolic orientation to auditory linguistic and visual linguistic. She shows major orientation to the qualitative symbols: esthetic, empathetic, visual, tactile and auditory.

Her cultural determinants are individual and family with minor associate influence.

Stegall's modality of inference is magnitude and difference with minor relationship.

30. Student Stewart is an eighteen year old female dental hygiene student with major theoretical orientation to visual linguistic. She shows major orientation to fourteen of the qualitative symbols with the first of the order being synnoetics, esthetic, empathetic, transactional and proxemics.

Her cultural determinants are individual and family with minor associate.

Stewart's modality of inference is relationship with minor difference and magnitude. She would tend to appraise that which is under consideration.

31. Student Thompson is a forty-six year old female secretarial student with major theoretical symbolic orientation to auditory linguistic and auditory quantitative. She shows major orientation to eight of the qualitative symbols with the first of the order being kinesics, histrionic, esthetic, synnoetics and kinesthetic.
Her cuitural determinants are family and individual with minor associate influence.
Thompson's modality of inference pattern is difference with minor magnitude and relationship. She would tend to appraise that under consideration before making an inference.

32. Student Tench is an eighteen year old male business administration student with theoretical symbolic orientation to visual linguistic. She shows major orientation to ten of the qualitative symbols with the first of the order being ethics, proxemics, esthetic, synnoetics and kinesthetic.
His cultural determinants are individual and family with minor associate.
Tench's modality of inference pattern is relationship with minor magnitude and difference. He would tend to appraise that under consideration before making an inference.

33. Student Wall is an eighteen year old male accounting student with major theoretical symbolic orientation to visual linguistic. He shows major orientation to seven of the qualitative symbols with the first of the order being empathetic, ethical, esthetic,

synnoetics and visual.

His cultural determinants are family wi n minor individual and associate.

Wall's modality of inference pattern is relationship and magnitude with minor difference. He would tend to appraise that under consideration before making an inference.

From these thrity-three students, twelve distinctly different theoretical symbolic orientation groupings can be made with thirty-three different qualitative symbolic orientation groupings. (See tables 1 and 2, page 25 and 26.)

From these same students eight different patterns of cultural determinants may be observed. (See table 3, page 27.)

And the same group demonstrated fourteen different modality of inference patterns. (See table 4, page 28.)

If one's symbolic orientation may be interpreted to mean the way one receives information, then these thirty-three students demonstrate thirty-three different styles of reception. And if cultural determinants may be interpreted to mean the processing of that information, then these students demonstrate eight different patterns of processing. And if modality of inference may be the process of making decisions about that information received and processed, then this group shows fourteen different decision making patterns.

By looking at these thirty-three students' preferred learning styles, it is apparent that if the Advancement Studies Department at CPCC individualizes

the learning process, it will have to take into account far more modes of learning than are now being used.

TABLE I

Twelve different theoretical symbolic orientation patterns. Only major orientations were considered in this table.

Major Symbolic Orientation	Number of Students
TVL, TAL	2
TVL	14
TAQ, TVL	3
TAL	1
TVQ	2
TAQ,TVL,TAL	2
TAL, TVQ, TAQ, TVL	2
TAL,TVQ	1
TAQ	1
TAL, TVL	1
TAL, TAQ	1
No Major Theoretical Symbol Indicated	3
	33

TVL = Theoretical Visual Linguistic

TAL = Theoretical Auditory Linguistic

TAQ = Theoretical Auditory Quantitative

TVQ = Theoretical Visual Quantitative

Table 2

Thirty-three different qualitative symbolic orientation patterns considering the first five majors for each student.

Student 1	Student 2	Student 3	Student 4	Student 5
Q(CP)	Q(CP)	Q(CES)	Q(CS)	Q(CP)
Q(CS)	Q(CK)	Q(CKH)	Q(CT)	Q(CS)
Q(CEM)	Q(CH)	Q(CEM)	Q(CES)	Q(V)
Q(CT)	Q(CT)	Q(CT)	Q(CEM)	Q(T)
Q(CK)	Q(CS)	Q(CS)	Q(CP)	Q(S)
Student 6	**Student 7**	**Student 8**	**Student 9**	**Student 10**
Q(CK)	Q(CP)	Q(CP)	Q(CS)	Q(CES)
Q(CES)	Q(CS)	Q(CEM)	Q(CEM)	Q(CP)
Q(CEM)	Q(CKH)	Q(CS)	Q(CES)	Q(CK)
Q(CET)	Q(ES)	Q(CES)	Q(CET)	Q(CEM)
Q(CP)	Q(ET)	Q(V)	Q(CT)	Q(T)
Student 11	**Student 12**	**Student 13**	**Student 14**	**Student 15**
Q(CEM)	Q(CES)	Q(CS)	Q(CK)	Q(CS)
Q(CP)	Q(CP)	Q(CEM)	Q(CET)	Q(CT)
Q(CH)	Q(CKH)	Q(CH)	Q(CP)	Q(CES)
Q(CES)	Q(CET)	Q(CES)	Q(CEM)	Q(ET)
Q(CS)	Q(V)	Q(CP)	Q(CES)	Q(CP)
Student 16	**Student 17**	**Student 18**	**Student 19**	**Student 20**
Q(CP)	Q(EM)	Q(CES)	Q(CP)	Q(CEM)
Q(CS)	Q(CP)	Q(CS)	Q(CKH)	Q(CH)
Q(CEM)	Q(CES)	Q(CP)	Q(CES)	Q(CK)
Q(CT)	Q(CKH)	Q(CEM)	Q(CEM)	Q(CT)
Q(CKH)	Q(CK)	Q(CKH)	Q(CK)	Q(CS)
Student 21	**Student 22**	**Student 23**	**Student 24**	**Student 25**
Q(CT)	Q(CP)	Q(CP)	Q(CES)	Q(CEM)
Q(CS)	Q(CES)	Q(CEM)	Q(CKH)	Q(CS)
Q(CKH)	Q(CKH)	Q(CKH)	Q(S)	Q(CES)
Q(CH)	Q(CS)	Q(V)	Q(CP)	Q(CKH)
Q(CEM)	Q(CT)	Q(T)	Q(CK)	Q(CET)
Student 26	**Student 27**	**Student 28**	**Student 29**	**Student 20**
Q(CT)	Q(CK)	Q(S)	Q(ES)	Q(CS)
Q(CKH)	Q(CES)	Q(CP)	Q(EM)	Q(CES)
Q(CES)	Q(CT)	Q(CES)	Q(V)	Q(CEM)
Q(CEM)	Q(CS)	Q(CKH)	Q(T)	Q(CT)
Q(CET)	Q(CP)	Q(CK)	Q(A)	Q(CP)
Student 31	**Student 32**	**Student 33**		
Q(CK	Q(CET)	Q(CEM)		
Q(CH	Q(CP)	Q(CET		
Q(CES)	Q(CES)	Q(CES)		
Q(CS)	Q(CS)	Q(CS)		
Q(CKH)	Q(CKH)	Q(V)		

Table 3

Eight different patterns of cultural determinants considering majors only.

Cultural Determinants	Number of Students
A I	3
I F	7
F I	5
I	7
A	3
I A	2
F	5
F A	1
	33

A = Associate

I = Individual

F = Family

Table 4

14 Modality of Inference Patterns

Pattern	Number of Students
R D L M'	7
R D'	1
M D L R'	2
R M L D'	5
M D' (K) R'	1
R L D M	5
L	4
D M L R'	2
M D L R' (K)	1
M 1 D' R'	1
M R L D'	1
R D L M' (K)	1
D L M' R"	1
R M' D'	1
	33

R = Relationship
D = Difference
M = Magnitude
L = Appraisal
(K) = Deductive Reasoning
' = Minor Influence

Table 5

17. I find it necessary to write down a telephone number as soon as I hear it in order to remember it.
4F

18. I communicate with friends and colleagues by telephone rather than by writing messages to them.
1D

19. I prefer to read a newspaper myself rather than have someone read it aloud to me.
3F

20. I prefer to follow verbal directions rather than written directions.
1E

21. I prefer to read directions rather than have someone interpret them to me.
3G

22. Verbal mathematics tests are easier for me than written mathematics tests.
2C

23. When I go shopping, I read the price of each item and keep a running total in my head.
4G

24. I quote statistical data to others in order to prove my point in an argument.
2B

25. I find it comfortable to add spoken or dictated numbers mentally.
2A

26. I understand more easily when I read information rather than when I hear it.
3H

27. I achieve best on written mathematics tests.
4B

28. After I dictate a letter, I read it to be certain it is correct.
3A

29. It is easy for me to remember the numbers and formulas I have heard during a conversation.
2E

30. I keep accurate written records in my check book.
4C

31. If I were buying a car, I would discuss the engine specifications with the salesman or a friend.
2H

32. I solve mathematical problems more rapidly if they are written.
4A

RECOMMENDATIONS

I. It is recommended that each faculty person in Advancement Studies read the full report of this practicum. Through the process of reading the report, it is hoped that more faculty will become interested in offering more options to learn. If a developmental studies program can demonstrate successful learning patterns (with perhaps even greater ranges of student needs than other departments of the college), the result is almost sure to have a positive impact on the college.

II. It is recommended that the Educational Sciences be studied by more of the faculty at CPCC, particularly the Department of Student Services. It is hoped that this report will generate enough interest in different learning styles and how those styles may influence instruction to cause faculty people to want to learn more about the concept of Educational Sciences. Any large implementation of this program will need the support of a staff of counselors and advisors. The impact would change the design of student services.

III. It is recommended that students be given a chance to respond to this kind of assessment. Educators sometimes seem prone to theorize too much without involving actual students. It is hoped that the students of this study by their favorable response to this process of learning their own styles will have an impact on other groups of students and other faculty. If students react favorably to this process, the program of Advancement Studies

may offer this process as a short course. This would be a way to be of service to the student without having first to have the cooperation of large groups of faculty.

IV. It is recommended that this report be used as the basis for gaining administrative approval for financial support for implementing the concept of Educational Sciences. It is felt that once the administration becomes aware of the significant differences that exist among individuals in their learning styles, seeking to discover the individual's preferred style will become a priority item.

V. It is recommended that the total concept of Educational Sciences be investigated by CPCC. This report has only dealt with the concept of cognitive style which is a result of symbols and their meanings, cultural determinants, modalities of inference and memory concern (the memory set is empty at this time). The other sciences are teaching counseling, and administrative styles and systemic analysis and decision making.

Ultimately attempting to match the learner's preferred learning style with the appropriate teaching counseling style, certainly ought to be a positive educational objective. And through a system of Educational Sciences it is entirely possible to consistently maximize learning and through the use of the seventh science, systemic analysis and decision making, it would be possible to evaluate at each level of the learning process.

VI. It is further recommended that this report be used as impetus to explore the possibilities of adapting learning to the multitude of preferred styles indicated by the students of this study. Since numerous learning styles are indicated, it will be necessary to adapt that which is to be learned to the preferred style of the individual. The adapting will need to be done by the instructor, and any serious attempt to individualize instruction will ultimately have to concern itself with more appropriate ways of learning.

VII. Finally it is recommended that this report serve as a basis for a futuristic outlook toward the process of learning. The thirty-three students of this study seem to positively reflect the idea of individuality. And discovering how an individual learns and designing instruction accordingly must look to the future for the way. Hopefully the direction of this report will point so toward new directions in the individualized learning process that it will give new growth and new design to the process of learning so that individuals may be able to adapt more easily to the future.

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